

Promotion of Rainwater Harvesting & Groundwater Recharge in Lalitpur Sub-Metropolitan City

Implementing Groundwater Recharge through Rainwater harvesting and practice of safe water in urban communities



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**Geneva
Global.**



Cover Photo:

Community Members of Pinchhe Tole enjoying safe water from biosand filter

Implementation and Technical Support:

Urban Environment Management Society (UEMS)

Local Partners:

Lalitpur Metropolitan City (LMC)

Khapinchhe User Committee, Khapinchhe

Kumbheshwar User Committee, Kumbheshwar

User Committee Pinchhe Tole

Yashodhar Mahavihar Sudhar Samitee, Bubahal

Funding Partners:

Legatum Foundation

Geneva Global Inc.



Words from Chairperson



UEMS has been implementing rainwater harvesting and groundwater recharge (RWH/GWR) since establishment in Lalitpur Sub-Metropolitan City (LSMC), currently upgraded to Lalitpur Metropolitan City (LMC), addressing growing water crisis in urban communities. Continuing the past learning, UEMS implemented "Promotion of Rainwater Harvesting and Groundwater Recharge in Lalitpur Sub-Metropolitan City" project in coordination with LMC and with financial cooperation of Legatum Foundation through Geneva Global Inc. The project included installation of RWH/GWR and biosand filter in four wards of LMC.

The project, supported by LSMC, Tole Sudhar Samitees, the Users Committees, the local communities, Geneva Global Inc, and other relevant stakeholders, has been successfully completed. I would like to thank all these stakeholders for their strong support. The staff of the project, who have untiringly performed their duties, too deserve a thanks for making this project happen.

Prem Singh Maharjan
Chairperson



Acknowledgment



In the present context, the accelerating rate of unplanned urbanization, concretization and industrialization has posed serious impact on the sources of water. These factors combined with deep and shallow boring system has accelerated the issue of water scarcity, due to which the groundwater level is depleting. Though Melamchi is expected to bring about 17 million liters of water daily to the valley in immediate future, it alone will not be a solution to the issue of water scarcity. The only alternative to solve the issue, in the long run, is to promote rainwater harvesting and groundwater recharge.

“Promotion of Rainwater Harvesting and Groundwater Recharge in Lalitpur Sub-Metropolitan City” project was implemented, with the financial support of Legatum Foundation through Geneva Global Inc., in order to address the water issues in Lalitpur. This project focuses on providing safe drinking water to the communities through rainwater harvesting, improvement of existing wells and installation off biosand filtration system, and raising the water table through groundwater recharge. The project has completed successfully with the effort and support of various stakeholders and partners. The Lalitpur Metropolitan City Office, ward offices of ward no. 8, 9, 18 and 19 of LMC, the User Committees and TLOs of the respective communities have been continuously been supporting the project, whom we would like to thank heartily. The media, who have always been in our support in raising public awareness and disseminating information regarding the subject, deserve our thanks as well. We would also like to express our gratitude towards Legatum Foundation and Geneva Global Inc. for their support and coordination throughout the project. Special thanks to Ms. Jennifer Brady, Program Director and Mr. Sunil Sainju, Program Advisor of Geneva Global Inc. Lastly, we also want to thank the staff of this project, who devoted themselves beyond the call of the duty to make this project a success.

Raj Babu Shrestha
Executive Director



Abbreviations

CBME	Community Based Monitoring and Evaluation
CBWRM	Community Based Water Resource Management
GESI	Gender Equity and Social Inclusion
GWR	Groundwater Recharge
IEC	Information, Education and Communication
LMC	Lalitpur Metropolitan City
LSMC	Lalitpur Sub-Metropolitan City
NDWQS	National Drinking Water Quality Standards
O&M	Operation and Maintenance
RWH	Rainwater Harvesting
SDGs	Sustainable Development Goals
TLO	Tole Lane Organization
UC	User Committee
UEMS	Urban Environment Management Society
WASH	Water, Sanitation and Hygiene



Purpose of this document

UEMS is one of the pioneer organizations in groundwater recharge through rainwater harvesting and utilization of groundwater through installation of biosand filter in communities. The communities of urban area, especially the urban poor and migrant workers living in rental rooms and marginalized population, have to face hard times due to lack of safe water. Promotion of rainwater harvesting and groundwater recharge systems is thus a necessity of urban area. Hence, for promotion of such systems in Lalitpur Sub-Metropolitan City, UEMS initiated projects in this sector about a decade ago. This year, with the support of Geneva Global Inc., UEMS implemented "Promotion of Rainwater Harvesting in Lalitpur" Project in 4 wards of LSMC. The sub-metropolis has converted to metropolis recently, hence now, Lalitpur Metropolitan City (LMC). The learning on rainwater harvesting and utilization of groundwater in the community will be helpful for better outcome in the upcoming programme.

This learning document has been prepared to document the program experiences and share the best practices, challenges and lessons learnt during the project. This document will help support the mitigation of challenges in water sector in future days.





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“Promotion of Rainwater Harvesting and Groundwater Recharge in Lalitpur Sub-Metropolitan City (LSMC)” project targeted to promote rainwater harvesting and groundwater recharge systems in LSMC to address the water hardship of urban poor, migrant groups and marginalized population. The major objectives of the project are to increase access of urban poor to safe drinking water through rainwater harvesting and groundwater recharge, and sensitize local government and community people on the subject along with lobby and advocacy for development of conducive environment on rainwater harvesting and groundwater recharge for future replication and scale up.

future replication and scale up.

Lalitpur Sub-Metropolitan City, popularly known as Patan, is currently one of the most vibrant cities of Nepal. It is located about 5 kilometers



South-East of Kathmandu. With its urban history dating back 2300 years, LSMC is one of the three major cities in Kathmandu valley, including Kathmandu and Bhaktapur. The project covered 4 communities of LSMC, ie., Khapinchhe ward no. 9, Pinchhe ward no. 8, Bubahal ward no. 18 and Kumbheshwor ward no. 22.



Rationale of the Project

The water scarcity and water quality problem has highly affected community people especially in their health who were rely on the traditional water sources. The communities of project area are forced to consume groundwater neglecting the water quality. The quality of water is most important for quality of life but due to economic status of urban poor communities, they are still lagging in the matter of safe water.

With the demand from communities for groundwater recharge and safe water, this project was initiated with the goal of solving the issue of water scarcity in these communities and improving the water quality side by side.

Project Goal and Objectives

The overall goal of the project is to promote rainwater harvesting and revive traditional ponds to recharge groundwater to access safe water through biosand filters for urban poor and low income families, migrants and their living environment.

The objectives of the project are as follow;

- To support city denizens against urban disaster
- To demonstrate rainwater harvesting in government offices, community buildings
- To lobby and advocate government bodies to install rainwater harvesting before infrastructure development
- To provide practical WASH education/training to school children to stimulate behavior change of the community so as to improve WASH facilities through school led rainwater harvesting
- To promote public private community participation in rainwater harvesting

Approaches Adopted

- **Community Based Water Resource Management (CBWRM)**

Community participation was encouraged in planning, designing and implementation of the schemes. The issues related to poor water quality, depleting water table, water resource management has been addressed through active participation of the communities. The User Committees have been trained on water quality test so as to ensure the capability of the communities in sustainability of the water supply systems.

- **Technological options for delivering water**

To get rid of water scarcity and water quality problem in the targeted communities, relevant technologies were adopted. Biosand filter technology was adopted in the target communities for safe and affordable drinking water where as RWH/GWR system was adopted to increase the water table and save water the future.

- **Capacity building of community stakeholders**

The members of User Committees, local plumbers and community people were selected and provided various trainings such as plumbers training, operation and maintenance training, water quality test training, etc. for effective operation and sustainability of water points.

- **Safe water supply**

The supplied water has been tested and water quality parameters ascertained in accordance to National Drinking Water Quality Standards (NDWQS) 2002. Four groundwater points of the project area were tested. The tests showed that the water was not potable before, but after the installation of biosand filter, the NDQWS was met, hence, the water was distributed as safe.



- **Gender Equity and Social Inclusion (GESI)**

Gender balance is maintained during formation of User Committees in each working area. Participation of women and their engagement in the project activities, meetings and discussions were found to be very impressive. It was found that women demonstrated keen interest in project activities, as the problem of water is closely linked with women than men.

The active support of women in installation of biosand filters has helped speed up the work. Likewise, in water quality test and community awareness program, the women were in the forefront. This shows that the community people are gradually changing and participation of women in the program is increasing.

- **Coordination with likeminded stakeholders during development of program plan, implementation and monitoring**

UEMS and UCs signed the agreement to implement the program as per approved project plan and budget. The data and information was collected through proper communication with relevant government stakeholders and the communities. The project plan and budget was shared to relevant government officials, LSMC, other relevant stakeholders and UCs. The coordination with communities, government and related stakeholders was further continued towards smooth progress of the program as well as to avoid duplication of work. In coordination with LSMC, advocacy initiatives such as formation of information desk in LMC were successfully conducted.

Modality of the project

The community people are always in top of the priority list for UEMS. UEMS conducted meetings with the communities to define their necessities. Based on the requests, the communities were prioritized and selected for implementation of the project. For the sustainability of the installed systems, user committees were formed through mass meeting of the particular community. The User Committees collected maintenance funds for sustainability of installed systems apart from community contribution for construction/installation. An agreement is signed between UEMS and respective User Committee to continue the program in particular project areas. At least one user committee member has to be present for observation in construction phase while UEMS provides technical support and monitor the overall construction process. After completion of construction works, the systems were handed over



to User Committee or TLOs. They are responsible for the overall management, O&M and sustainability of the installed system. During the implementation period, UEMS also capacitates the user committees through various trainings, exposure visits and exchange programs.

Financial Mechanism

Cost Sharing

UEMS practices the cost sharing modality to implement the project to ensure ownership and responsibility of the communities. The project cost has been shared with User Committees of Khapinchhe, Pinchhe, Bubahal and Kumbheshwor. The total cost of the project and the cost sharing is given below:

SN	Partner	Total Contribution (in NPR)
1	Geneva Global Inc./UEMS	1,609,330
2	Khapinchhe UC, Pinchhe UC, Bubahal UC, Kumbheshwor UC	417,500
	Total	2,026,830/-

Financial Transparency

The financial transparency was maintained by directly involving the community members in procurement procedure and construction activities. UC's focal persons were involved along with UEMS staff members for clarity in financial transactions and transparency. The information was shared to community members and relevant stakeholders through Community Based Monitoring and Evaluation (CBME) charts.

Beneficiaries of the Project

The total beneficiaries of the project are 3214. The table below shows the detail beneficiaries of the project activities.

Beneficiaries of Software Activities			
	Male	Female	Total
Community people/Ucs/Tole Sudhar Samittee	355	282	637
School Students	125	136	261
Government Officials/Other Stakeholders	37	10	47
Total	517	428	945
Beneficiaries of Infrastructure Construction			
	Male	Female	Total
Pinchhe	330	332	662
Khapinchhe	178	164	342
Bubahal	340	296	636
Kumbeshwor	304	325	629
Total	1152	1117	2269
GRAND TOTAL	1669	1545	3214

Project Plan and Achievements

	Planned Activities	Achieved
HARDWARE	Installation of 4 RWH/GWR systems	8 RWH/GWR system were installed, viz., Khapinchhe-3, Pinchhe-1, Bubahal-1 and Kumbeshwor-3 (The community of Kumbeshwor demanded RWH/GWR systems instead of biosand filter as the water quality is good there. Also, the community of Khapinchhe demanded for extra RWH/GWR system.)
	Installation of 4 biosand filtration systems	3 biosand filters were installed, ie., Khapinchhe-2x1000 L, Pinchhe-3x1000 L, Bubahal-2x1000 L
SOFTWARE	Conducting feasibility assessment and technical survey for RWH/GWR system installation	Technical survey, feasibility assessment were conducted
	Conducting 4 mass meetings	4 mass meeting conducted in project areas
	Formation of 4 User Committees	4 User Committees were formed in project areas
	Conducting Water Quality Tests in 4 communities	Water Quality tests were conducted in 4 communities
	Conducting trainings to plumbers and skill labors	2 plumbers trainings were conducted
	Conducting O&M trainings for the UCs	4 Operation and Maintenance (O&M) trainings and 4 refresher trainings were conducted
	Providing Water Quality Test training to the UCs	Water Quality Test training was conducted to UC representatives and community members of the project areas
ADVOCACY	Organizing field visits for the government officials	Field visit for government officials were conducted to Dhulikhel, Nyadal and Chyasal
	Publication of Advocacy Materials	1 learning document was published for advocacy
	Publication of 5 sets of IEC materials	5 sets of IEC materials were published
	Publication of calendar and dairy	Calendar and diary were published
	Development of Information desk	The information desk has been installed in LMC Office
	Production of video documentary	Video documentary was produced including best practices UEMS on RWH/GWR and biosand filter as well as the project activities were captured
	Organizing Advocacy Workshop	Advocacy workshop was conducted to push government authorities to implement present government policies on RWH/GWR
	Organizing promotional campaigns (orientation and documentary show on RWH/GWR to school students and women group, hoarding boards in project areas, marble plates)	3 orientation programs and documentary shows were conducted for school students 4 orientation programs and documentary shows were conducted for women groups Hoarding boards with information of RWH/GWR and biosand filter was placed in each of the project area Marble plates with the project information, UEMS and community contribution was placed in project area

Challenges and Mitigation Measures



Followup with government officials, their commitments and their frequent transfers were the biggest challenges while implementing the project. Regular followup and information update was practiced to mitigate this issue. However, due to the change of the official, we had to repeat the sensitization process more than once.

The policies in RWH/GWR have been formulated but the status of implementation is low. Continuous lobby and advocacy activities, and meetings were conducted for developing implementation measures and establishing proper monitoring mechanism.

- The members of UCs are involved in their own business, so it is difficult for them to give adequate time towards the project. Therefore regular follow-ups were conducted in the target communities and activities including meetings and trainings were conducted in their suitable time.
- The wage of skilled and unskilled workers increased after the 2015 earthquake and also, there is a shortage of workers due to reconstruction, thus hampering the construction activities of the project. To solve this issue, the semi-skilled and unskilled workers of the local communities were used with proper continuous guidance and required training.

Changes Perceived

Development works is targeted to bring about positive change in the communities. Some effect of works could be observed immediately while others could be visible in long run as the impact of the program. The short term changes perceived in the project areas are follows:

Short Term Changes

- Community people, teachers and students are aware on the RWH/GWR system and biosand filtration technology as well as water quality. The alternative

source of water RWH/GWR has raised the interest of communities for the replication of this system.

- Total 2269 people now have safe and affordable drinking water facility in their own locality.
- The training on water quality test has developed the capacity of local cadres to test water in their locality.
- Basic plumbing training has developed the capacity of local plumbers of the project areas.

Long Term Changes

From the sustainable point of view the long term changes of the project are as follows:

- The User Committees have taken the responsibility to coordinate and support for development intervention at the community level, which is a



- remarkable achievement of the project. Some User Committees have initiated additional works with the support of LSMC Office by the time of completion of this project. This demonstrates that the platform will be sustainable in the long run.
- The awareness raising trainings, orientations and campaigns have supported in enhancing the knowledge of concerned stakeholders, community people, teachers and students regarding rainwater harvesting and groundwater recharge as well as biosand filter.
- There is practice of saving funds in each User Committee for operation and maintenance of the installed system which will support for sustainability of system.
- Collective effort and contribution of the community for installation of the system made the UCs and community people ownership feeling.

Lesson Learned

Every project teaches some lessons, which guides us through further planning projects. The successful projects should be replicated with required modifications with reference to the lessons learnt. The project “Promotion of Rainwater Harvesting



and Groundwater Recharge in LSMC” was a short term project supported by Legatum Foundation and Geneva Global Inc. Following lessons have been learned from the project.

- Capacity building of the communities and their mobilization as well as active participation in the project activities is important as community feel their ownership through regular involvement.
- Regular review and planning incorporated with capacity building programs with UCs and community people is necessary to get updated on the local level issues and encourage them to continue the activities.
- The coordination with communities, government and related stakeholders are vital for the smooth progress of the program as well as to avoid duplication of work.
- Use of social media and other media sources were found to be more meaningful and effective for amplifying the advocacy issues and wider dissemination of information to public.
- Regular engagement with government agencies and development partners is essential to stay up to date on relevant policies and recent development of policies.



Community Voices

Quenching the Thirst with Affordable Safe Water

The community of Pinchhe has been facing water scarcity since ages. We were living through it though; we never thought we could develop our own water system. Before 6 months, we had to pay Rs.50 for 20 litres jar for drinking.



After discussions with UEMS during the initiation of this project, we were quite hopeful about the new dream that was set in our eyes. The plan was to install 3 biosand filtration systems of 1,000 liters capacity. After the water quality test of the new water system, we feel safe to drink this water than we have ever felt. Next step was

distributing the water to community people.

After the completion of the system, UEMS provided us various formal and informal trainings and capacity development platforms on managing our User Committee as well as developing business plans with the new water system. The user committee, with the suggestions from UEMS and TLO, has distributed membership cards to the interested community members. Those with the membership card will get water at minimum cost, whereas the non-members will have to pay slightly more.

The users are quite happy with the good quality water available in the community itself. We don't have to depend on external sources, nor deal with the uncertainty of the central water distribution system of Kathmandu valley. We would like to thank UEMS for providing us safe and affordable drinking water to quench our thirst, in the community itself. We request UEMS to continue working like this in other parts of Nepal as well.

*Sanu Kaji Maharjan
President, User Committee Pinchhe Tole*

Influenced by the biosand filter in our community

I own a grocery about 2km from home. Where I work, the water quality is very bad, so I carry water from home. It was very difficult to get good water. I can't carry water enough for the whole day when I leave for the morning. As the member of Khapinchhe UC, I got an opportunity to attend the training provided by UEMS. We learned the benefits of



biosand filter. The community level biosand filtration system installed in Khapinchhe motivated me to construct biosand filter in my home.

Now, I am happy to use the water treated by the filter. Now I don't have to carry water from home. I use the water locally available, yet I'm confident that I'm safe against water-borne diseases.



Before



After

*Suresh Maharjan
Member, Khapinchhe User Committee*



UEMS team involved in the project

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**Striving for Big Impact
through Small Efforts !**




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